CLAIMS

1. A hybrid assembly operating at an operating frequency comprising:

a substrate having an upper surface and a lower surface;

conductive paths on said upper surface for conducting high frequency signals along said upper surface of said substrate;

a plurality of stars made of an electromagnetic band gap material on said upper surface, said electromagnetic band gap material having slow wave characteristics, said plurality of stars tessellating said upper surface between said conductive paths,

each of said stars having a center section formed from a regular polygon, said center section having projections extending from said center section, said projections and said center section forming a periphery, said periphery engaging adjacent stars along said periphery and separated from said adjacent stars by an interspace,

said stars separated by a distance from said conductive paths; each of said stars connected to a conductive via, said conductive via connected to ground potential.

2. A hybrid assembly as in claim 1 wherein said center section is a first square, said first square having four equal first sides, each of said four first sides meeting at a ninety degree angle with the next first side to form first four corners, each of said four first sides having a first length.

3. A hybrid assembly as in claim 2 wherein said projections extending from said center section are four second squares, each of said second squares having four second sides, each of said second sides one half of said first length, each of said second sides meeting at a ninety degree angle with the next second side to form four second corners.

4. A hybrid assembly as in claim 3 wherein said four second squares are centered on said first four corners of said first square.

5. A hybrid assembly as in claim 4 wherein said first length is inversely proportional to said operating frequency of said hybrid.

6. A hybrid assembly as in claim 5 wherein said interspace along said periphery is inversely proportional to said operating frequency of said hybrid.

7. A hybrid assembly as in claim 6 wherein semiconductor structures are mounted over said stars, said semiconductor structures having a plurality of electrical contacts with said conductive paths.

8. A hybrid assembly as described in claim 7 wherein said vias connecting said stars to said ground potential traverse said substrate and connect to a conductive layer on said lower surface of said substrate.

9. A hybrid assembly as described in claim 8 wherein the intersection of four of said stars forms a window between said four intersecting stars.

10. A hybrid assembly as described in claim 9 wherein interconnecting means to semiconductor structures mounted over said stars pass within said window without electrical contact to said stars.

11. A method for manufacturing a hybrid assembly operating at an operating frequency comprising the steps of:

etching conductive paths on an upper surface of a substrate for conducting high frequency signals along said upper surface of said substrate;

printing a plurality of stars made of an electromagnetic band gap material on said upper surface, said electromagnetic band gap material having slow wave characteristics, said plurality of stars tessellating said upper surface between said

conductive paths, each of said stars having a center section formed from a regular polygon, said center section having projections extending from said center section, said projections and said center section forming a periphery, said periphery engaging adjacent stars along said periphery and separated from said adjacent stars by an interspace, said stars separated by a distance from said conductive paths; each of said stars connected to a conductive via, said conductive via connected to ground potential.

12. A method as in claim 11 wherein said polygonal center section is a first square, said first square having four equal first sides, each of said four first sides meeting at a ninety degree angle with the the next first side to form first four corners, each of said four first sides having a first length.

13. A method as in claim 12 wherein said projections extending from said center section are four second squares, each of said second squares having four second sides, each of said second sides one half of said first length, each of said second sides meeting at a ninety degree angle with the next second side to form four second corners.

14. A method as in claim 13 wherein said four second squares are centered on said first four corners of said first square.

15. A method as in claim 14 wherein said first length is inversely proportional to said operating frequency of said hybrid.

16. A method as in claim 15 wherein said interspace along said periphery is inversely proportional to said operating frequency of said hybrid.

17. A method as in claim 16 wherein semiconductor structures are mounted over said stars, said semiconductor structures having a plurality of electrical contacts with said conductive paths.

18. A method as described in claim 17 wherein said vias connecting said stars to said ground potential traverse said substrate and connect to a conductive layer on a lower surface of said substrate.

19. A method as described in claim 18 wherein the intersection of four of said stars forms a window between said four intersecting stars.

20. A method as described in claim 19 wherein interconnecting means to semiconductor structures mounted over said stars pass within said window without electrical contact to said stars.